

AMENDMENTS TO THE SPECIFICATION

Page 1, lines 4-14

The present invention relates to an apparatus and to a method for modifying a power flow in a segment of an electric power line with multiple phase conductors. In the present text, we will refer to "phase line" to describe what is commonly known by a person skilled in the art as "phase". The apparatus and method are used for modifying the power flow in a segment of an electric power line and also enable ~~namely~~, but not exclusively, ~~to~~ de-ice an electric power line, to modify the power flow through an electric power line in a static or dynamic manner, to stabilize an electric power network, to filter harmonics of an electric power line, to absorb or dissipate power transmitted by an electric power line, or even to limit the electric current of an electric power line.

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Another object of the present invention is to ~~enable a faster modification of~~ quickly modify the power flow than what is possible in the prior art. Thus, for a power line operating at 60 hertz, the modification of the power flow can be done in a period of time shorter than 8 milliseconds without waiting for the passage of the current by zero.

Another object of the present invention, which is obtained by a preferred embodiment, is to propose an apparatus and a method for modifying a power flow in a segment of an electric power line, so that ~~enable a~~ power flow of said segment is sent directly towards another segment of the electric power line.

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According to the present invention, there is also provided a ~~method for modifying a power flow in a segment of an electric power line, each segment including phase lines each having n conductors electrically insulated from one another and short~~

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The present invention also ~~enables to carry out~~ provides a method for modifying power flow in a segment of an electric power line. The method comprises step a) of providing a power unit that includes a power converter 18 for converting power between the first and second pairs of terminals 20 and 22, and an electric component 24 connected to the second pair of terminals 22 and capable of circulating power through the power converter. The first pair of terminals is of course connected in series with the conductor 12 of the phase line A of the segment 6. The method also comprises step b) of converting power between the first and second pairs of terminals 20 and 22 by means of the power converter 18 for modifying said power flow in the segment 2. Preferably, the method further comprises step c) of selectively connecting and disconnecting the first pair of terminals 20 in series with the conductor 12 by means of the switch 26, in response to control signals. Preferably, in step a), n-1 power exchange units are provided, in step b), the power is converted by at least one of the n-1 power converters, and in step c), the n-1 power units are connected and disconnected by means of their switch 26 respectively to n-1 conductors of the phase line A of the segment 6.

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In the present case, for safety reasons, so as to prevent that all the conductors of a same segment open simultaneously, it is important that a same switching device regroup the switches 26 associated to a same phase line. This safety switching device which prevents the simultaneous opening of all the conductors of a same phase line could be for example the one proposed in international patent application published under No. WO 00/35061 corresponding to US patent No.6,396,172 B1.

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In the present case, according to the method proposed by the present invention, in step a), an additional power unit is provided for forming a set of two power units 15 and 16; in step b), the power is converted by at least one of the two power converters 18; and in step c), the two power units 15 and 16 are connected and disconnected by means of their switch 26 respectively to the two conductors 10 and 12 of the phase line A of the segment 6. It is worth noting that in the present embodiment, preferably of course, the converter 18 and the electric component 24 of the power unit 15 ~~could be omitted for simply keeping the switch 26 connected in series with the conductor 10~~ can be removed from the current flow path by closing the switch 26. The closed switch creates short circuit across the power exchange unit, and the conductor operates as though the power exchange unit is not present. The layout shown in Figure 2 could ~~enable to de-ice~~ the conductors of the phase lines of the segment 6 and to carry out FACTS functions.

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In this Figure 3, are also shown controllers 40, a supply 42, and a transceiver 44. The previously mentioned components with sensors (not shown) ~~enable to~~ control the converters 18 from a control station (not shown) so as to carry out FACTS functions for controlling the power flow in the segments 6 and 8, and as a result controlling the power flow in an electric power network. The supply 42 operates by capacitive coupling or by inductive coupling or with the help of a solar panel or a combination of these components. Of course, the controllers 40, the supply 42 and the transceiver 44 can be used with each of the embodiments shown in Figures 1 to 9. These control components, whether the controller 40, the supply 42 and the transceiver 44, ~~could be~~ is carried out by what is proposed in international patent application published under No. WO 02/41459 US patents 6,396,172 B1 and 6,727,604 B2 (continuation in part).